

THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

ISSUED BY
SCIENCE SERVICE

B and 21st Streets
WASHINGTON, D. C.

EDWIN E. SLOSSON, Director
WATSON DAVIS, Managing Editor



SUBSCRIPTION: \$5 A YEAR, POSTPAID

The News-Letter, which is intended for personal, school or club use, is based on Science Service's Daily Science News Bulletin to subscribing newspapers. For this reason, publication of any portion of the News-Letter is strictly prohibited without express permission.

Vol. VIII. No. 249

Saturday, Jan. 16, 1926

NEW CAUSE OF BREAST CANCER INDICATED

Mother mice which had bred a number of litters of young which were prevented from suckling their babies developed cancer far more frequently than normal mice. This is the latest contribution to the subject of cancer, presented before the American Society of Zoologists, by Dr. Halsey J. Bagg, of the Cornell Medical College. Mice that were allowed to suckle one set of babies and were kept away from the next alternately, developed cancer after a shorter period than those kept from their babies entirely.

As a result of the experiments, Dr. Bagg is convinced that breast cancer in mice may be caused by stagnation and decomposition of the secretions in the breast during the period when the mother mice would normally give milk to their young.

Further evidence along this line was obtained by tying some of the breasts in some mice so that normal drainage of the secretion was prevented. In such cases he found that cancer tended to develop on the side that had been tied.

Dr. Adair, of Cornell, has shown that out of several hundred human cases of breast cancer a high percentage had abnormal activity of the breast glands, due to various causes. Only a small number of these cases had normal gland activity.

Whether cancer is caused by an organism or by abnormal cell growth, or whether a combination of the two is necessary, was discussed at length. Dr. James Murphy, of the Rockefeller Institute expressed the opinion that Gye and Barnard, of London, have not presented sufficient evidence that a cancer germ exists. Their success in transmitting cancer of chickens by means of a filtrate free from cells may be due to the presence of some enzyme causing abnormal growth, rather than to ultra-microscopic organism which Gye and Barnard regard as responsible for the disease. He considered the fact that cancer can be produced in mice by application of coal tar to the skin is evidence against the theory that cancer is caused by an infectant.

When the definite cause of cancer is known it will not only be valuable information for the cancer specialist, but it will help physiologists to understand normal cell growth, said Dr. Murphy.

Heredity may or may not be an important factor in cancer cases among human beings, but an experiment with laboratory mice, described by Dr. L. Strong, of Harvard University, indicates that heredity may play a part in unusual circumstances.

He followed the development of cancer in a long family tree of mice, all descended from one original parent stock. After a long period of inbreeding there were two strains of mice, one of which was one hundred per cent susceptible to cancer, whereas the other was much more resistant.

This has no direct bearing on cancer in man, said Dr. Strong, because such inbreeding of cancerous persons, as it is done artificially in the laboratory, is not likely to happen among human beings.

PAINTED POTTERY THOUGHT TO BE 10,000 YEARS OLD.

Excavation of the sites of Sumerian civilization which preceded the Babylonian point to the human occupation of the Mesopotamian valley long before the date of 4,000 B.C., assigned to the creation of the world by the marginal notes of the Bible. The magnificent palace of the Sumerians which was discovered at Kish has now been completely excavated by the joint expedition of Oxford University, England, and the Field Museum, Chicago. Beneath the original floor of bricks of the main court, which from their shape cannot date much later than 3,000 B.C. were found several feet of deposits which take back human occupation on this site for a very considerable period of time. It has been suggested

by one authority that they must date at somewhere between 4,000 and 5,000 B.C. Many examples of Sumerian art of great significance for early culture were discovered and a great number of tablets of baked clay were found in a library mound. When examined we may perhaps learn to which race the Sumerians belonged - a question upon which there are at present conflicting views. According to some authorities they must have come from Central Asia. Others think from the highlands of Asia Minor or Armenia.

The work of the Kish Expedition in the coming season will be extended to Bughateit, a very ancient site sixteen miles from Kish where painted pottery of very early type, and inscribed tablets were found last year. Such pottery has been found in the lower strata of most of the oldest Sumerian sites in Mesopotamia, in the early stages of the culture of Susa excavated by the French expedition under de Morgan and by the American explorer on the neolithic site of his exploration at Anau in Turkestan, to which he assigned a date of 8000-9000 B.C. and it occurs at intervals across central Asia as far as northeastern China, where it has recently been discovered on a Neolithic site. If it were possible to determine the relative age of these different finds, it might afford a clue to the direction from which the Sumerians entered the country.

In addition the Kish Expedition will excavate the great temple of the Mother Goddess of Kish, situated near the Palace of Kish which was called Harsay Kalamma in an inscription discovered in the library mound last year. The interest of this excavation is great, especially as it will be remembered that it is probably in this temple that Sargon I (2750 B.C.) the great king who founded the kingdom of Akkad, was a ministrant to the Goddess before he became the leader of the revolutionary movement which overthrew the reigning monarch and brought Sargon himself to power.

AVERAGE LIFETIME SOON TO BE A CENTURY

The average baby born around the year 2000 A.D. may expect to spend 100 years on earth, instead of about half a century, which is the average lifetime at present. This is the prediction made by Dr. Hornell Hart, of Bryn Mawr college, before the American Sociological Society recently.

"Unless we wreck our civilization in the next 75 years, which is unlikely, many a baby will be born with 200 or more years of life before it, and men and women 100 years of age will be the normal thing, but instead of being wrinkled and crippled, they will still be in their vigorous prime," said Dr. Hart. "This may be predicted with more certainty than that with which Jules Verne predicted the submarine or Bacon the automobile and airplane."

There is a chance that we have about reached the limit of reducing the death rate, and that there will be few spectacular gains in the future, he explained. It is also possible that medical science has now found its stride and that further gains in life expectation may be made at about the present rate. This means that the average individual born in the year 2000 could expect to live about 87 years. The hypothesis which Dr. Hart finds most plausible, however and on which he bases his forecast, is that the gain will be even swifter than in recent years.

"During the past million years, the tendency has been for man to gain control over his environment with increasing swiftness," he explained. "A second line of evidence is that since 1910 medical science has begun to cope successfully with diseases of later life."

"In the field of preventive medicine, research workers are making major discoveries which bid fair to eclipse past attainments in life saving. Furthermore, new research laboratories are being opened, new apparatus and techniques are being discovered, an increasing number of trained investigators is available, and unprecedented sums of money are being placed at the service of scientists in this field."

"Present tendencies indicate the practical elimination of disease and of old age through scientific discoveries in the next century or two," said Dr. Hart.

MAY PREDICT WEATHER BY USE OF RADIO

Studies of the effect of weather conditions on radio reception by which it may soon be possible to forecast the weather by noting the clarity with which programs from near and distant stations come in were described to the American Association for the Advancement of Science by Prof. J.C. Jensen, professor of physics at Nebraska Wesleyan University.

Prof. Jensen, who is also engineer-in-charge of radio station WCAJ, has been studying the relations of wireless and weather for nearly ten years. "Actual reception," he stated, "depends not only on the signal strength, but also on the ratio of signal to static. When the strength of static interference begins to approximate the signal strength, reception becomes impracticable."

Static noises are known to vary from day to day and have been shown to be worst on the approach of a storm area. When the storm has passed, the high area which follows is characterized by settled weather in which 'atmospherics' are largely absent."

Some of the conclusions which have been reached as a result of this work are as follows:

Reception is best when the broadcasting station and the receiving set are within the same area of high atmospheric pressure, or when the weather conditions are settled.

Good reception may occur when the transmission is from a high pressure area into an adjoining low pressure area, or vice versa; but when it takes place across a low pressure area so as to extend through it to a high on the opposite side, low audibility occurs.

Static disturbance is most troublesome when the low pressure area of an approaching storm is to the northwest.

Fading is more troublesome at night than in the day and is most severe when there is little difference in atmospheric pressure in different parts of the country, a condition which accompanies unsettled weather.

Prof. Jensen pointed out that these conclusions are only preliminary and require further study, but to test them, he has been issuing a daily forecast of radio conditions from his station, and that the success of these has been very encouraging.

SOUND ABSORBENT PLASTER INVENTED

In response to the assertion of a prominent hospital official that "noise is the curse of modern hospital construction" comes the invention of a "sound absorbing" plaster which is from eight to ten times as absorbent of sound as the ordinary plaster, according to actual tests by its inventor, Dr. Paul E. Sabine of the Riverbank laboratories near Chicago.

"Modern buildings of solid construction with smooth hard surfaces make the present day interior an almost perfect reflector of sound," said the inventor. "Proper sanitation and satisfactory acoustics are apparently mutually antagonistic requirements.

"Ordinary masonry walls are much better reflectors of sound than the best mirrors are of light. The best mirrors reflect about 90 per cent of their light energy, but a tile wall with hard plaster reflects more than 97 per cent of the sound energy which strikes it. From such walls it can be shown that a sound initially of ordinary intensity must undergo some 450 reflections before it is absorbed so as to be inaudible. A simple computation shows that the sound remains in the room for 4.8 seconds before it is absorbed.

"If a carpet is put on the floor it absorbs 25 per cent of the sound energy which strikes it, and reflects 75 per cent. Instead of 450 reflections as above

we now have 144 reflections requiring 1.5 seconds to become inaudible. But sanitary conditions in a hospital bar carpets, draperies, and other sound absorbing apparatus. The ideal solution of the problem lies in the wall surfaces of the room," the investigator continued.

As a practical demonstration of the sound absorbing qualities of the new plaster, the physicist has plastered two rooms, one with the ordinary plaster, and the other with a thickness of one-half inch of the absorbing plaster. The difference in the acoustics of the two rooms is pronounced. In the first there is a reverberation of sound for several seconds, and in the second, all sound is "dead".

A small portable pipe organ, arranged to speak at a constant wind pressure, is used as a source of varying the pitch. This has with it a specially designed chronometer for measuring the duration of audible sound.

The collected data show that the absorbing efficiency of the plaster is much greater for tones that are higher than 512 vibrations per second, which is, said the physicist, similar to the crying of patients in pain, or of infants, in the upper range of the pitch scale. The material seems to be particularly fitted for the walls of hospitals.

"The acoustical properties of the plaster depend upon its porosity. Its surface, texture, and hardness is that of other rough finish plasters", he said. "A new paint has also been invented to go with the plaster."

MUSICAL TALENT MEASURED BY TESTS

Scientific methods of measuring musical ability have been developed to the point where they can be regularly used in schools of music or public schools. Dr. Carl E. Seashore, of the State University of Iowa, told the American Association for the Advancement of Science at a recent meeting. The Eastern School of Music, at Rochester, has recently adopted this system of selecting or rejecting prospective students, said Dr. Seashore.

To indicate the reliability of scientific tests that measure a sense of rhythm and other factors in musical ability, he told of experiments at the Carnegie Institute of Technology.

Music teachers were asked to select 20 pupils, ranging from very superior to very inferior, and to agree upon their rating. Without knowing about this rating the experimenter made measurements of musical talent in the students, and evaluated them in the light of his common sense judgment as a musician. His judgment was found to be practically identical with that of the teachers.

"In other words," said Dr. Seashore, "an expert in these measurements may take an unknown child and within an hour evaluate the degree of musical talent with such confidence that he is in practical agreement with those who have taught the pupil a long time."

Other uses for a yardstick of musical talent were indicated by the psychologist:

"In war," he said, "the success or failure of the German submarine program depended on our ability to locate the submarine accurately. A man with a sensitive ear was needed to use the measuring device which located the submarine. By use of certain measures of musical talent we could pick with absolute certainty the man who had the good ears, and on such choice countless human lives and millions of dollars might depend."

YOUNG CHILDREN HAVE LONG MEMORIES, TEST SHOWS

Children of two to six years learn better when they are taught a certain lesson on alternate days than when they are drilled on it every day. This evidence on the complex process by which human beings acquire knowledge was presented by Miss Julia A. Kirkwood, of the Iowa Child Welfare Research Station, before the American Association for the Advancement of Science recently.

It was found that if a child once learns to pair off a set of blocks and pictures without making mistakes, and then relearns the "block game" a year later the relearning will not take nearly so long.

"There have been very few investigations into the problem of how young children learn," said Miss Kirkwood. "If children are to be taught efficiently there must be thorough scientific knowledge of the process by which the child learns, and this can be acquired only from experimental results obtained by placing the child in a controlled learning situation, and by analyzing carefully the results obtained."

SAYS MAN WAS ALWAYS A BIPED

Man stood on his own legs, weak-kneed though he was, from the time of his origin, for as Dr. Dudley J. Morton of the department of surgery of Yale University, told members of the American Anthropological Association at a recent meeting, fossil evidence shows that an erect posture has existed in the anthropoid ape stem as far back possibly as the Oligocene.

"Of all the great apes, the chimpanzee, the gorilla, the orang and gibbon, the slender and agile gibbon is the only one who has preserved good proportions between leg and body, although this fact is obscured by its long strong arms," Dr. Morton said. "It is an erect, running tailless biped, both in the trees and on the ground. The other apes have long powerful arms, shoulders and chests, weak pelvis and short legs, which show that they are predominantly treeclimbing."

Tree life may have enabled animals to develop the upright posture, Dr. Morton explained, for all animals which are familiar with tree life, or come from comparatively recent arboreal ancestry, assume erect squatting position easily and habitually. But all the arboreal animals but the primates, to which man belongs, are nevertheless essentially quadrupeds, for their thighs are not extended as in man.

"The ancient apes walked better than the modern ones," Dr. Morton said. "The antiquity of the erect posture in this line of creatures and the recognition of the physical changes that hand locomotion in trees will bring about, show that the quadruped posture must have resulted from the enfeeblement of the legs from under use and the bad balance of the upper part of the body from over development."

"Just as the long arms of the apes were due to their tree-climbing habits, so the greater leg development in man resulted from his habit of walking on the ground. There must have been a time, Dr. Morton believes, when this development had gone about half way, when the arms and legs of both groups were of the same length. Such a condition, he thinks, would be the point where the ape and human stem separated.

"To the original human creature erect standing on the ground was a real physical effort, in spite of his precious experience of tree life," Dr. Morton said. "Without holding on to something, it would have been **extraordinarily** difficult to stand for a long time."

Their feet were all toes and there was no heel to support the body weight. Their knees were still bent and their hips partly flexed, and the spine bent forward at the shoulders. The perfect body pose of modern man was of slow development in which great changes took place in the feet, leg, hips, spine and other parts of the body.

The entire human body, Dr. Morton said, has become remodelled on a central axis plan, and the weight of different parts of the body is so balanced that only slight muscular effort is needed to maintain the equilibrium of the whole. Man is the only animal today that grows straight up like a lily on a stem.

"Aboreal man, as a tree-living human being must be considered a myth," Dr. Morton said, "for the characteristics which definitely mark the human being as man are ones which are associated with terrestrial bipedism. The tree-living habits must have been given up long before the skeletal changes could have occurred."

TELLS HOW AMATEURS MAY AID ASTRONOMERS

How amateurs, with no mathematical or other scientific training, can aid the professional astronomer to solve the mysteries of space was explained recently when Leon Campbell, of the Harvard College Observatory, told the listeners of radio station WEEI of the work of the American Association of Variable Star Observers and other bodies of lay astronomers. In fact, the amateur does not even need a telescope, for meteors may be observed with the unaided eye, it was said.

"When one realizes that millions of meteors enter the earth's atmosphere daily," said Mr. Campbell, "some of them no larger than grains of sand, others large enough to light up the heavens even in broad daylight, one soon perceives that there is plenty of work available in observing meteors, in counting them, gauging their positions and estimating their brightness, especially during meteor showers. If one watches any selected area of the sky on almost any clear night for, say, half an hour, he will be able to count several conspicuous meteors, and with no more than a passing knowledge of celestial topography, he can plot their paths and thus furnish material for determining the points in the sky from which they appear to come."

Another field for the amateur without a telescope is in watching for "new stars" or novae, as the astronomer calls them, which suddenly flash out from previous obscurity. R. Watson, an amateur astronomer in South Africa, has discovered two of these, Mr. Campbell stated, while Rev. T. D. Anderson, an amateur in Edinburgh, Scotland, has discovered three. "Since most of the novae occur near the Milky Way," said Mr. Campbell, "it might be well worth while for the amateur to familiarize himself with the constellations in which this well known band of stars lies."

Interesting and important as these endeavors are, the chief work of the amateur can be accomplished with the aid of a small telescope. Occasionally as was the case recently with Leslie C. Peltier, an amateur of Delphos, Ohio, he may find a new comet, which will bring him fame, and, if he is the first to see it, the comet will be named after him. The late Dr. Joel H. Metcalf, a Unitarian minister of Winchester, Mass., discovered six, while the late Wm. R. Brooks, of Geneva, N.Y. found a dozen in twenty years, Mr. Campbell said.

However, the most valuable work of the amateur, in the opinion of Mr. Campbell, is in observing variable stars, which more or less regularly diminish in brightness, only to flash out again as bright as before. The American Association of Variable Star Observers numbers over 300 members, and in the past fourteen years they have accumulated more than 200,000 observations on about 500 of these stars. "So completely is this work being carried on that the professional astronomers rely almost entirely on the results of such variable star observers for the fundamental data necessary to a better understanding of the cause underlying the variations of these stars," it was said by the speaker, who concluded by requesting still more cooperation between the laymen and the astronomers.

BRIGHT BRAINS GROW UNTIL TWENTY

If intelligence was a visible part of human anatomy, like height, so that it could be seen and measured with a tapeline, we could easily observe that the average individual stops growing at around the age of fifteen, but that the brighter child continues to shoot up head and shoulders above the crowd, until he is twenty years old, or perhaps older.

Evidence along this line, showing that all minds, like all bodies, do not stop growing at the same age, but that some continue to grow much longer was presented by Dr. L. L. Thurstone, of the University of Chicago, before the American Psychological Association recently.

"During the war it was possible to compare the brightness of men of different age groups by means of the army psychological tests," said Dr. Thurstone. "The tests indicated that intelligence does not increase in adult age. Men thirty years old did not do much better in the tests than men twenty-one years old. Experiments to determine the point at which adult intelligence is reached placed the age level of so-called adult intelligence in the vicinity of fourteen or fifteen years."

By a new method of measurement, a study has been made of 3,000 London children, three to fourteen years old, and a study of 10,000 American children from eight to nineteen years. Results show that brightness increases as far as the study has been carried, that is, up to twenty years."

It still remains a fact that the average brightness of the adult population as measured by psychological tests, is no higher than that found among school children in the teens, Dr. Thurstone pointed out. "But bright children," he said, "undoubtedly continue to grow in intelligence beyond the conventional so-called adult level of fifteen."

SOLVING THE RIDDLE OF INSULIN

Insulin, the extract from the pancreatic gland, that was first prepared by Banting and Best at the University of Toronto three years ago and since used extensively in the treatment of diabetes, may soon be made by synthesis in the chemical laboratory, according to a statement by Prof. Treat B. Johnson of Yale University at the American Chemical Society meeting recently.

Prof. John J. Abel of Johns Hopkins University, who has been studying the structure of the natural insulin, has come to the conclusion that it is an "auto-oxidizable sulphur compound, probably of the thio-peptide type." This means that it is an unstable substance similar to ordinary albumin in composition but simpler in structure. Prof. Johnson announced that research has been started in the Yale laboratories on the structure and reactions of this kind of compound in the hope that it may lead to a method of making it artificially, or to the discovery of a substitute of value in medical science.

Insulin belongs to the class of secretions of the ductless glands, known as "hormones", which in minute amount circulate through the blood and control bodily processes. Insulin is the hormone that regulates the utilization of sugar from which the muscles obtain their energy. In diabetics it is lacking but may be supplied by injections of the prepared insulin.

SUN BURN RAYS OF SUN GROWING STRONGER

The ultra-violet radiation of the sun, invisible rays of too short wavelength to be seen, but which are responsible for tanning people's skins and which also affect photographic films, is increasing with the rise in the number of sun spots. This is the conclusion of Dr. Edison Pettit, astronomer at the Mt. Wilson Observatory, in a paper read before a recent meeting of the American Astronomical Society.

Dr. Pettit's studies have been concerned with the ultra-violet waves about one-seventy-five-thousandth of an inch long, just a little shorter than the deepest violet rays visible to the eye, which are about one-sixty-five-thousandth of an inch in length. As glass absorbs the ultra-violet rays, it has been necessary to use quartz lenses, and the amount of radiation is measured by means of a thermocouple, a device which gives a minute current when light, either visible or invisible falls on it, the exact current being measured by means of a delicate galvanometer.

The method used has been to compare the ultra-violet radiation which passes through the quartz lenses and a thin film of silver, with green light passed through similar lenses, a green celluloid filter and a thin layer of gold, a series of measurements being made, first of the ultra-violet and then of the visible green light. The whole apparatus is attached to one of the observatory's

telescopes, so that it can follow the sun in its motion across the sky.

When he first began his investigations in June, 1924, Dr. Pettit found that the amount of ultra-violet light from the sun was about two-thirds that of the green, but as the atmosphere absorbs more of the ultra-violet than it does of the green, he had to calculate what it would be if he could examine the sun's light before it passed through any of the air around the earth. In this way it was found that the sun gave off about 39 per cent more of the ultra-violet than of the green, but in November, 1925, the ultra-violet radiation, when corrected for atmospheric absorption, was over one and a half times as great as the green, and it is still getting stronger. This means that the proportionate amount of the rays which tan the skin has increased 83 per cent in the last year and a half. This, Dr. Pettit said, is in harmony with the increase in the number of sunspots, of which an unusually large number have been seen on the sun's face within the last few months.

OLD-FASHIONED TREATMENT HAS UNEXPECTED RESULTS

Bleeding, once the universal remedy for all kinds of ailments, has been shown to bring relief to dogs suffering from a type of convulsions brought on by lack of lime in their blood which follows the destruction of the parathyroid glands, situated in the sides of the throat. Drs. W.W. Swingle and Wm. Wenner, of Yale University, reported results of their experiments before the meeting of the American Society of Zoologists.

Dogs showing these symptoms, they learned, had less than two-thirds of the normal amount of lime in their blood. They opened the veins of some of their animals and removed about three and one-half ounces of blood. Thereupon the dogs recovered, at least temporarily, and though they had lost some blood it was found that the calcium concentration in what was left had risen to above three-fourths of the normal.

TABLOID BOOK REVIEW

PITTED STONES - By J. M. Ames Sheldon. E. L. Hildreth & Co., Brattleboro, Vt.

This is a monograph of a group of stone implements of ancient origin and uncertain use, in the collection of the Pocumtuck Valley Memorial Association. The author inclines to the opinion that these stones were not used as hand hammers, as others have suggested, but that they were smoothing and polishing implements.
